CLAIMS

I claim:

1. An apparatus comprising:

an elongate member having dimensions suitable for insertion into a body;

at least one thermally conductive heating element coupled to a portion of the elongate member, the heating element comprising material whose electrical resistance changes in response to a change in temperature; and

an anemometry circuitry interface electrically coupled to the heating element.

2. The apparatus of Claim 1, wherein the elongate member comprises a needle.

3. The apparatus of Claim 2, wherein the needle has an outer diameter between 0.009 inches and 0.134 inches.

4. The apparatus of Claim 2, wherein the needle comprises a material of at least one of stainless steel and ceramic.

5. The apparatus of Claim 1, wherein the elongate member is a rod.

6. The apparatus of Claim 1, wherein the heating element comprises at least one of a wire, a film, and a thermistor material.

7. The apparatus of Claim 1, wherein the heating element has a length which is approximately equal to or less than a known tissue thickness.

8. The apparatus of Claim 7, wherein the length of the heating element is between 0.010 inches and 0.400 inches.

9. The apparatus of Claim 1, wherein the anemometry circuitry interface comprises:

a first electrically conductive lead electrically coupled to a first end of the heating element; and

a second electrically conductive lead electrically coupled to a second end of the heating element.

10. The apparatus of Claim 1, wherein a portion of the elongate member comprises an electrically conductive material and wherein the anemometry circuitry interface comprises:

an electrically conductive lead electrically coupled to a first end of the heating element, and

the elongate member electrically coupled to a second end of the heating element.

11. An apparatus comprising:

a needle having dimensions suitable for insertion into a body;

at least one thermally conductive heating element coupled to a portion of the needle, the heating element comprising material whose electrical resistance changes in response to a change in temperature; and

anemometry circuitry electrically coupled to the heating element.

12. The apparatus of Claim 11, wherein the needle has an outer diameter between 0.009 inches and 0.134 inches.

13. The apparatus of Claim 11, wherein the needle comprises a material of at least one of stainless steel and ceramic.

14. The apparatus of Claim 11, wherein the heating element comprises at least one of a wire, a film, and a thermistor material.

15. The apparatus of Claim 11, wherein the heating element has a length which is approximately equal to or less than a known tissue thickness.

16. The apparatus of Claim 15, wherein the length of the heating element is between 0.010 inches and 0.400 inches.

17. The apparatus of Claim 11, wherein the anemometry circuitry is electrically coupled to a first end of the heating element by a first electrically conductive lead and is electrically coupled to a second end of the heating element by a second electrically conductive lead.

18. The apparatus of Claim 11, wherein a portion of the elongate member comprises an electrically conductive material and wherein the anemometry circuitry is electrically coupled to a first end of the heating element by an electrically conductive lead and is electrically coupled to a second end of the heating element by the elongate member.

19. The apparatus of Claim 11, wherein the anemometry circuitry comprises:

a circuit having the heating element and a variable resistor as resistive circuit elements; and

an amplifier electrically coupled to the circuit

to sense the difference in voltage drop across the heating element and the variable resistor caused by the difference between a first resistance of the heating element and a resistance of the variable resistor,

to amplify the voltage difference, and

to input the amplified voltage difference back to the circuit to cause a modification of a temperature of the heating element such that the heating element assumes a second resistance.

20. The apparatus of Claim 19, wherein a plurality of heating elements are coupled along a length of the elongate member, and further comprising:

anemometry circuitry separately coupled to each of the heating elements such that the heat dissipation characteristics measured by the plurality of anemometry circuits can be used to determine at least one of injection depth and tissue type.

21. A method comprising:

introducing a heat dissipation measurement device into a body comprising tissue; and

determining at least one of injection depth and tissue type based on measured heat dissipation characteristics of the tissue.

22. The method of Claim 21, further comprising identifying a location of at least one tissue/tissue interface.

23. The method of Claim 22, wherein the heat dissipation measurement device comprises at least two thermally conductive heating elements and wherein identifying comprises:

inserting the heat dissipation measurement device into a first tissue such that a first heating element is disposed within the first tissue and positioned to measure heat dissipation characteristics of the first tissue; and

moving the heat dissipation measurement device further into the body such that

the first heating element is disposed in a second tissue and positioned to measure heat dissipation characteristics of the second tissue, and

a second heating element is disposed in the first tissue and positioned to measure heat dissipation characteristics of the first tissue.

24. The method of Claim 23, wherein the first tissue is one of a vessel wall and a blood volume and the second tissue is the other of the vessel wall and the blood volume.

25. The method of Claim 23, wherein the first tissue is one of a cardiac muscle and a blood volume and the second tissue is the other of the cardiac muscle and the blood volume.